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TABLE OF CONTENTS.

PAGE.

EDITORIAL ARTICLES:—The Army and the Forests.—The Nomenclature of Garden Plants 437
The Clark Elm. (With illustration.) 438
Color Notes on California Wild Flowers.—I. . . . . *C. R. Orcutt.* 438
Diseases of Chrysanthemums Caused by Insects. (With figure.) *J. G. Jack.* 439
PLANT NOTES:—Pyrus nigra, Sargent . . . . . *Professor L. H. Bailey.* 440
FOREIGN CORRESPONDENCE:—London Letter. . . . . *W. Watson.* 440
CULTURAL DEPARTMENT:—The Propagation of Hardy Herbaceous Plants, *E. O. O.* 442
The Wild Garden . . . . . *Mary Treat.* 442
Some American Ferns . . . . . *F. H. Horsford.* 444
Notes on Shrubs . . . . . *J.* 444
Saccolabium Hendersonianum . . . . . *John Weathers.* 444
Schubertia grandifolia. . . . . *G.* 445
Gordonia Altamaha (pubescens) . . . . . *Joseph Meehan.* 445
THE FOREST:—The General Condition of the North American Forests.—I. 445
CORRESPONDENCE . . . . . *B.* 447
RECENT PUBLICATIONS 447
PERIODICAL LITERATURE 447
NOTES 448
ILLUSTRATIONS:—Insects Affecting Chrysanthemums, Fig. 55 441
The Clark Elm, Lexington, Massachusetts 443

The Army and the Forests.

AT the meeting of the American Forestry Association in Philadelphia last year a resolution was adopted to petition the Congress of the United States to pass an act withdrawing all forest-lands on the public domain from sale until a commission appointed by the President shall have made the necessary examination and reported to Congress what part of these lands should be kept permanently in forest. In accordance with these same resolutions, it was asked that the army should be employed to protect the public forest from spoliation and destruction until the Commission had reported a plan for a permanent system of forest-management. The objection which was offered to this last proposition, that the army was not large enough to perform the duties which such an enactment would impose upon it, has some weight, although we are not likely to secure any legislation in the near future which will give to the country the services of a body of forest-wardens which will approach in numbers the military forces which might be made available for this purpose.

The objection, however, that such an employment is not a proper one for the soldiery of the United States does not seem to be well taken. A conspicuous example in which the army, or rather a minute detachment of it, has served in exactly this capacity is found in the management of the Yellowstone National Park. For some reason Congress failed to make any appropriation for paying the salaries of the Superintendent of the park and his assistants for the year ending June 30th, 1887, and therefore a troop of cavalry under Captain Harris was ordered into the park. This was not a military post, and therefore the captain, who acted as Superintendent, had no right to enforce military law, his sole authority, under a special act, consisting in a power to remove trespassers from the bounds of the park. Nevertheless, the presence of the visible power of the Federal Government, as represented by this little garrison, has proved a more efficient protection to the park than could have been hoped. It is reasonable to suppose that the same moral effect would follow if the forests were placed under the control of the organized and disciplined military forces of the nation. It would not be necessary to have a soldier ready to put out every fire and arrest every depredator. If it were once understood that the national forests were under the immediate charge of the army, and that persons who harmed them would be dealt with after the rigorous and summary processes of military law, marauders and intruders of all kinds would be deterred from any attempt at the spoliation of Government property. Under the present system, or lack of system, these attacks are invited by the assurance that there is no danger of punishment, for although the laws may seem to be rigid they are practically never enforced.

If this system of entrusting public forests to the army were not avowedly temporary, it might be worth while to consider whether the officers of the army, being men to a certain extent of scientific training, would not make the best supervisors of such a system of forest-policy as would be the best for this country. It will be many years before it will pay to go into the refinements of forest-practice here, and perhaps no body of men could be found who could be so readily prepared in the rudiments of forest-management as the officers of our army. We are ultimately to have forest-schools in this country no doubt, and that time will come when there is a demand for skilled foresters; but is it altogether an impracticable idea to add to the course in West Point some instruction in the rudiments of forestry and to establish the nucleus of the first forest-school there upon the Government reservation? Here are 2,000 acres of forest-land, and why would this not be an excellent practice-ground if some system of forest-instruction were to be given to the cadets? At all events, this large tract of Government forest-land would offer an admirable chance for lessons in the rudiments of forest-management if the woodlands on the public domain are to continue for any time under the protection of the army.

However this may be, we venture to suggest that in the reservation of public forest which is likely to be set apart by the act which has already passed the House of Representatives, and is now before the Senate, a detachment of the army would be all the protection needed for several years to come. We refer to the bill making a so-called public park in Tulare County, California, of certain designated townships which contain the remarkable grove of Sequoias to which allusion has been already made in these columns. It might have been better if this territory had been designated as a forest-reservation instead of a park. The name, however, is of little consequence if it is understood that this grove is to be kept as it now is, a primeval forest. There is not so much need of "improving" the scenery which Nature has made as there is of protecting it from desecration, and it seems to us that for the present the most efficient way in which this can be kept from desolation by fire and axe and trampling and browsing herds is to place it under the guardianship of the army. In time to come the making of roads and other works will be necessary, but there is no need of haste in this matter. The great desideratum now is protection, and it would seem that this could be provided more effectively by the army of the United States than by any other agency.

The Nomenclature of Garden Plants.

THE report of the Committee of Nomenclature at the late Convention of Florists in Boston showed that the instances in which old plants have been fraudulently sent out under new names are less numerous than has been usually supposed. The truth is that when a dealer deliberately attempts to deceive buyers the case is usually brought to public attention, and so much comment is made that the evil seems to be much more prevalent than it really is. This Committee, which, in addition to other methods of obtaining information, sent out twelve hundred circulars of inquiry, found that a large percentage of the mistakes were unintentional, and arose from mixing labels or mistaking identity in some other way easily and naturally explained. When the immense number of garden

varieties of many plants is considered, the wonder is that buyers can make their orders with such assurance that almost every plant received will be correctly named.

This weeding out of synonyms from catalogues, however, is a small portion of the work which this Committee is called upon to do, and many of the suggestions made by Mr. Raynolds and Mr. Manning were well worthy of consideration. In the first place, it is pretty clear that some rules should be laid down for the direction of all persons who name new garden-plants—rules similar to those adopted by the American Pomological Society and now observed by all who name new fruits. The rules on the nomenclature of vegetables which the Association of Agricultural Colleges proposed are also worth considering, and some of them might apply as well to flowering plants as to vegetables. For example, the name should be short, and consist, if possible, of a single word. It should not be superlative or bombastic. A plant should not be called a hybrid when it is not a product of true species, and it may be added that garden varieties should never have Latin names. One good reason for this is that since descriptive Latin terms have been used in botanical nomenclature they should not be used in the case of plants which are sufficiently distinct for garden purposes, but which are botanically identical. Besides this, the addition of varieties will bring about at last a name too cumbersome for ordinary use. Good examples of these names could be taken from almost any nurseryman's catalogue, and such combinations as *Ulmus campestris aurea Wredei* are by no means uncommon. English names are certainly to be preferred for ordinary garden varieties, and these names, as has been well held, should not be descriptive. It would not be difficult to formulate a code of rules which could be applied to the great majority of florists' plants, and there is little doubt that if some authoritative organization like this Association should promulgate these rules new plants would as a rule be named in conformity with them.

As a branch of this general question an effort is being made to bring the descriptions of plants in catalogues to greater accuracy, and here we are at once confronted with the difficulty of describing colors. It would seem that the only way to convey an accurate idea of the color of a flower is to have some chart of standard colors to which reference can be made. As an illustration of the difficulties in this regard it was stated in the Convention that a single plant was described in seventeen different colors or combinations of colors, which ranged from "pink with a white centre" through "yellow orange red" up to "velvet shaded purple." Such fearful and wonderful colors as "garnet red tinted with rosy brick" and "black amaranth marmorated chestnut brown" were given as attempts to describe accurately the tints of some flower or leaf. The sample cases of spool-silk made by the Brainerd & Armstrong Co., which have been advertised in this paper, contain more than 200 shades, but very few of them, it was said, are found practically useful in describing flowers. On another page of this issue Mr. Orcutt attempts to use the "Nomenclature of Colors" adopted by Robert Ridgeway for the use of naturalists. Of course, if one has not this system to refer to, Heliotrope-purple and orange-vermilion will not convey a precise meaning, but if these terms and others become identified with a standard print they will be of great assistance to all who wish to describe the tints of flowers.

"Whatever contributes to render the scenes of nature delightful is amongst the subjects of gardening; . . . and nothing is unworthy of the attention of a gardener which can tend to improve his compositions, whether by immediate effects, or by suggesting a train of pleasing ideas. The whole range of nature is open to him, from the parterre to the forest; and whatever is agreeable to the senses or the imagination, he may appropriate to the spot he is to improve; it is a part of his business to collect into one place the delights which are generally dispersed through different species of country.—*From Whateley's "Observations on Modern Gardening,"* 1770.

The Clark Elm.

WE have already given a picture of a typical American Elm (see p. 287), and in this number (see p. 443) we give a winter view of another characteristic form of this tree as it appears in New England, where it is known as the "Willow-tree type." It is a magnificent specimen, standing in Lexington, and known to many, for its home is amid scenes which are memorable in Revolutionary annals. It is on the premises of the Clark-Hancock house, whose history is summarized in this tablet: "Built 1698; enlarged 1734. Residence of Rev. John Hancock fifty-five years, and of his successor, Rev. Jonas Clark, fifty years. Here Samuel Adams and John Hancock were sleeping when aroused by Paul Revere, April 19th, 1775." It is within earshot, too, of the spot where Major Pitcairn called upon the Lexington rebels to throw down their arms and disperse. It was but a stripling on that day, having been set out only five years before by the Rev. Jonas Clark named in the tablet. Its age, accordingly, is about 125 years.

The trunk forks at four feet ten inches from the ground. The special divisions of the two great branches spring lightly upward in noble arches, the branchlets at the extremities sweeping the ground even in winter, while in summer when the branches are weighted down by the leaves the whole tree presents the appearance of an immense leafy dome poised upon a tremulous edge of green. The circumference of the trunk at four feet above the ground is thirteen feet five inches. The circumference of one branch at the point of furcation is eight feet seven inches, and the other branch eight feet eight inches. The height of the tree is seventy feet, and its spread is eighty-four to ninety feet.

Our illustration is from a photograph by Mr. Henry Brooks, of Medford, and the tree is one of those whose portraits will appear in the "Typical Elms and other Trees of Massachusetts," now in course of preparation by that gentleman.

Color Notes on California Wild Flowers.—I.

IN describing the colors of the following wild flowers of California, I have taken pains to compare each with the colored plates given in the "Nomenclature of Colors for Naturalists," by Robert Ridgeway, of the United States National Museum. I have matched each color as closely as I was able in the field, with fresh flowers before me, usually in consider-able numbers, so as to note the range of variation in each.

This character is frequently ignored by botanists, but with cultivators of flowers it should receive very careful attention. Ridgeway's "Nomenclature," above referred to, though not wholly satisfactory and far from complete, is still our only standard authority on the subject. To secure uniformity of nomenclature no other chart can be used with safety, unless compared with Ridgeway's first. The sample-case sent out by Messrs. Brainerd & Armstrong Co. I have not seen, but if it uses a different nomenclature from our standard, it will be as mischievous as useful. Ridgeway's "Nomenclature" may be had of Messrs. Little, Brown & Co., of Boston, and should be in the hands of every one desiring accuracy in his descriptions.

California is associated in the mind with gold and "golden" flowers. Frequent in literature are references to "fields of green and gold" and "seas of golden flowers;" yet it is doubtful if the color of gold can be matched in any flower that grows. The "golden" Eschscholtzia is of an orange hue, and any yellow tint is golden to the popular eye.

Fritillaria biflora, familiarly called by the children around San Diego by the name of the Chocolate Lily, is an elegant plant, related to the Crown Imperial. The plant grows from a few inches to a foot or more in height, with broad base leaves and a strong leafy stem, producing from one to five large and beautiful deep claret-brown campanulate flowers, like a spray of bells. The flowers are an inch long, slightly mottled with green. It is one of the finest species in a large genus of stately and handsome flowers.

Allium fimbriatum is a pretty plant, abundant in the mountains of Southern and Lower California, bordering the Colorado Desert. It sends up a stout scape a few inches high, bearing

twenty-five or thirty showy flowers of a very dark rose-purple color—sometimes lighter. Its Mexican name is *Lavina*.

Lathyrus venustus is the very pretty wild Pea so abundant through Southern and Lower California, in the cañons and valleys near the coast. The clusters of flowers are of a bright magenta. It is frequently taken for our more magnificent *Lathyrus splendens*, which has much larger flowers of a brilliant rose-red to crimson.

Frasera Parryi is a tall, stately biennial, growing in the mountains of San Diego County, usually from two to four feet in height. The first year the plant forms a cluster of broad radical leaves, which makes a mat on the ground, and, as the leaves are usually bordered with white, the plant is quite pretty at that stage. The second season it sends up its tall panicle of curious blossoms, with a deeply four-parted, rotate corolla, each division with a glandular and fringed pit on the upper side. The flower is scarcely an inch across, white (sometimes of a slightly greenish cast), with an apple-green spot on both sides of the hairy glands; while the midveins from the glands to the apex of the divisions are Heliotrope-purple. The corolla is thickly dotted with fine spots of Heliotrope-purple. It is a curious and striking plant, well worthy of cultivation, like nearly all herewith mentioned—many of which, indeed, are in cultivation in Europe, if not in America.

The Mohave Desert, in San Bernardino County, yields a multitude of beautiful flowers, none of which probably exceed in brilliancy of coloring the orange Mariposa Tulip (*Calochortus Kennedyi*). I have only been able to compare dried specimens of this lovely flower with Ridgeway's nomenclature, by which I would describe its color as between a Chinese orange and an orange-vermilion. If I may trust my memory through the eight years since I collected this plant I should say that its color when fresh is the same as when dry. The plant seldom exceeds four to six inches in height, and produces several of its showy flowers, which are about two inches across.

A large plant of *Cereus Schottii*, from San Quintin, Lower California, is just blooming in the garden (July 7th, 1890). This gray-headed "Old Man" Cactus, known by the Mexicans as the *Carambuya*, called by some of them the *hombre viejo* or *cabeza vieja*, according to Brandegee, and in Sonora known as the *Zina*, *Sina* or *Sinita* (Schott), is a tall, stately plant ten to fifteen feet or more in height. The flower is of a delicate shade between rose-pink and flesh color, an inch long and less than an inch across, quite pretty, but very insignificant beside the huge plant that produces it.

Opuntia prolifera, the common Chollas Cactus so abundant in the vicinity of San Diego, has flowers of a wine or pomegranate purple, which are very pretty, but are so well guarded by a multitude of formidable spines as to almost repel admiration. The fruit is proliferous, the seeds almost invariably abortive. The plant forms impenetrable thickets, covering quite extensive tracts along dry water-courses, on hill-side and mesa, attaining a height of four or five feet or more, and is one of the most characteristic features in the vegetation of Southern California near the coast.

Orcutt, California. *C. R. Orcutt.*

Diseases of Chrysanthemums Caused by Insects.

THE cultivation of Chrysanthemums has come to occupy such a large place in floriculture that any disease which affects their growth and beauty naturally causes annoyance if not pecuniary loss to the growers of these popular flowers. They have not been subject to many injuries in the past, the best known being caused by Aphides commonly called green or black "flies," and by a fungus or "mildew" which attacks the leaves and affects their appearance and vitality. Gardeners have learned how to avoid or combat these pests, but there is another trouble which they have suffered from for years for which no definite cause has been given.

In describing this disease of the Chrysanthemums many gardeners use the terms "blinding" or "disbudding," meaning that the ends of the branches look as if stunted, the leaves are crowded together and the internodes much shortened; and worst of all, the flower buds become abortive and the expected blossoms are not produced. It was thought that these effects might be due to minute fungi, but expert fungologists were unable to detect any fungus growth in badly affected specimens submitted to them.

It is generally the practice of gardeners to start the Chrysanthemum cuttings in frames or under glass in spring, and after danger of frost is over to transplant them to the open ground. Aphides soon become abundant on the tender terminal shoots, and these are followed by other insects of the bug family, whose relation to the Chrysanthemum is little known. Few caterpillars or insects of other orders attack the plants. With the object of discovering if possible the cause of this blight of the flower buds, a careful examination of the Chrysanthemums in different localities about Boston was made last year and have been continued the present season. The results although incomplete show conclusively that the distortions are due to the work of bugs of one or more species, which, with their slender beaks, pierce and suck the sap of the leaves and tender stems, causing the arrest of growth and giving them the familiar tufted appearance.

Probably the worst insect—one which is more abundant on the plants than all the other species together—is a leaf-hopper (*Cicadula quadrilineata*) which was first described in 1884 by Professor S. A. Forbes in his Fourteenth Report as State Entomologist of Illinois, and which is stated to have been abundant in wheat fields and injurious to Indian corn in some parts of that state. When at rest the general color of this little insect is an iridescent light yellowish green. The head is pale yellow with black eyes, and several distinguishing but variable and small black spots in front of the head between the eyes. It is very active, and on account of its color as well as diminutive size is not easily seen either on the plants or when flying, unless close and careful attention is given.

One or two larger species of leaf-hoppers are occasionally found about the plants, but they are usually rare and very probably their presence is accidental.

The common Tarnished Plant-bug (*Lygus lineolaris*) is always present in considerable numbers and doubtless is very mischievous. The Four-striped Plant-bug (*Lygæus lineatus*) punctures the young leaves and causes brown spots in them, which are often so numerous as to result in the drying and withering of the foliage. This bug is bright yellow, about three-tenths of an inch long, and has a broad and a narrow black stripe down each wing cover. Both this and the Tarnished Plant-bug feed upon a great variety of vegetation.

The Insidious Flower-bug or False Chinch-bug (*Triphleps insidiosus*) is one of the smallest bugs found on Chrysanthemums. The general color is black, but there is a broad yellowish white or light reddish band across the front half of the wing covers, while the ends appear colorless.

This little bug has a favorable record as preying upon other injurious insects, and whether it is injurious or beneficial to the Chrysanthemum has not been clearly ascertained. It is usually present in considerable numbers, and may be found, in various stages of growth, hidden in the crevices about the buds and young leaf-stalks.

Plagiognathus obscurus is common about the plants, but whether it injures them or attacks other insects is not known, as little seems to have been recorded of its habits. That it may be a serious enemy of the plants may be inferred from the fact that observation on three or four specimens of a closely allied species of bug showed that they were capable of keeping the young fronds of a Fern (*Aspidium*) in check and causing them to become stunted and brown colored. Besides these bugs several other species are occasionally found; and there are also many small flies noticeable about the plants. The flies are often of bright or metallic colors and are harmless, probably being attracted to the plants by the sweet "honey dew" from the Aphides.

Gardeners usually care more for a means of destruction than a description of an insect, so that only the names or most obvious characters of the injurious bugs are given here. The detailed and often lengthy descriptions may be found in various writings on insects.*

All of the insects named are true bugs, having no jaws, but obtaining their food by sucking the juices of plants (or, as in the case of *T. insidiosus*, the juices of other soft insects) by means of their slender beaks, which they insert within the tissue. They thus avoid taking any poison which may be applied on the leaves and which would be effectual in destroying foliage-devouring larvæ. Consequently, recourse must be had to substances which compass their destruction by suffocation. Fresh Buhach, or Pyrethrum Powder, is one of the most effective remedies against many insects of this kind, and it has the advantage of not being injurious to the plants. By the use of a hand-bellows it may be dusted on dry; or, it may be applied in a liquid form at the rate of a tablespoonful to a gallon of water. It should be dusted or sprayed forcibly, so as to come in contact with all the insects. This remedy is

* *Lygus* (= *Phytocoris*) *lineolaris*, Harris' Insects Injurious to Vegetation, pp. 202–202.

Triphleps (= *Reduvius* or *Anthocoris*) *insidiosus*, in Description of the Insects of North America, by Thomas Say, edited by J. L. Leconte, vol. I., p. 357.

Plagiognathus obscurus, P. R. Uhler, in Hayden's Fifth Annual Report of the United States Geological Survey (1872), p. 418.

considered too expensive by many people, and for such there is a cheaper and possibly more effective alternative in Kerosene Emulsion. But some care is required in the application of this, because, if too strong, it is liable to injure the foliage. The kerosene must be first mixed with milk or soap,—that it may readily become incorporated with water when diluted—soap being generally considered the better for this purpose.

In two gallons of boiling water dissolve a pound of common hard soap; after the soap is dissolved, and while still boiling, but moved from fire, add half a gallon of kerosene oil. This must be stirred briskly or churned until the oil will not rise to the top when the mixture is allowed to stand and cool. When used, this emulsion should be diluted with five or six gallons of water. It should be strongly sprayed upon and about the plants by means of a force-pump or powerful syringe. The finer and stronger the spray the better the results are likely to be, because the Cicadulas take to flight upon slight alarm, and the spray should be far-reaching enough to overtake and thoroughly wet them. Particular care should also be given to spraying the under sides of the leaves and the close tufts of foliage, because it is in such situations that a great many of the insects are concealed and carry on their worst work. If it is found by experiment that the plants will bear a stronger emulsion less water should be added, but the condition of the plants and the state of the weather are factors which have to be considered in determining this question.

The dusting or spraying should be often repeated, because, as already stated, all these insects are known to feed on other kinds of plants, and they may easily migrate from them to the Chrysanthemums. The insecticide will kill the useful aphid-eating larvæ of the "lady-bird" beetles, but this cannot be avoided. The plants would be safe if covered with fine netting or gauze stretched over light frames.

Figure *f* in the drawing represents the fly and larva of an insect which, under various names, has long been known as being very injurious to the foliage of the "Marguerite" or "Paris Daisy" (*Chrysanthemum frutescens*) and some allied species, and also to Cinerarias, Eupatoriums, etc. Last season a few were found mining in the leaves of some choice Japanese Chrysanthemums, and as it may become troublesome it is noticed here that gardeners may be on their guard against it. The larvæ or little maggots live within the tissue of the leaves, and make long, irregular burrows or mines, which are easily traced by the lighter color of the surface. These mines are often so abundant that the leaves are completely destroyed, and even where they are but few they cause serious disfigurement. To pick off and destroy the infested leaves as soon as noticed is the only remedy known. If not destroyed the little maggots change to pupæ within their mines, and soon afterward small ashy gray flies come forth, and proceed in the work of perpetuating the species and accomplishing further destruction.

These flies have been most commonly referred to as *Phytomyza nigricornis* and *P. affinis*. But Mr. F. Kowarz, of Austria, a specialist on this group of flies, after examining a number of specimens collected in the vicinity of Boston, has decided that they are a distinct species, and has proposed the name of *Phytomyza Chrysanthemi* for them. His careful and detailed description has not yet been published in this country. It is most probable that the species came with plants from Europe.

Eristalis tenax, Fig. 55 (*e*), is a fly about which there has recently been some discussion, in an entomological journal,* regarding its probable pollenization of the Chrysanthemums. On the approach of cold weather in the autumn it is often found in considerable numbers in greenhouses, where it passes the remaining days of its life in resting upon the flowers or darting about with a loud buzzing noise. In the journal referred to, Mr. John Thorpe, the well known florist, is quoted as stating that he had never seen the insects outside of his greenhouses, and never before the first week in October. They are certainly most noticeable at that time, but are to be found about a great variety of flowers in our gardens from May or June throughout the rest of the season. Among great numbers of other insects these are usually overlooked or mistaken for honey bees, to which they bear some superficial resemblance. But *E. tenax* has only one pair of wings, and is perfectly harmless, inasmuch as it can neither sting nor bite.

It is often found in our dwellings in the autumn. Around Boston, gardeners complain of injury to white Chrysanthemum blossoms by a dark fluid excrement which these flies eject on the petals, and for this reason they are usually destroyed.

They are found over a large portion of the northern hemisphere, but were first noticed in America at Cambridge, Massachusetts, in 1875. The larvæ, known as "rat-tailed maggots," live in offensive pools of mud and water. Pools around manure piles are favorite haunts; and, no doubt, the barrels and tubs of manure and water often kept in and about greenhouses for fertilizing purposes facilitate the multiplication of the insects. In the open air the flies cannot avoid distributing pollen of some kinds of flowers, although it is done in a haphazard way. Whether they are useful in pollenizing or cross fertilizing the Chrysanthemums could be determined by a few simple experiments.

The illustration is made from drawings by Mr. W. H. Denton.

Arnold Arboretum. *J. G. Jack.*

**Entomologica Americana* (Brooklyn, New York), May, 1890; also additional notes in July number.

Plant Notes.

Pyrus nigra, Sargent.

PROFESSOR SARGENT'S notes upon *Pyrus arbutifolia* (page 416) are interesting and valuable, and I am confident that he is right in making two species out of the plants which we have thrown loosely into one. His characters of separation are well drawn and important. I have noticed the distinctions he records, and but a few moments before reading his article I had been studying my specimens, and had come to the conviction that we have two species.

His note recalls a most interesting case of synonymy. In my garden I have two plants, top-worked on *Pyrus Aucuparia*, which I bought of a leading nursery as *Amelanchier ovalis* and *A. alpina*, both of which are the *Pyrus nigra*, as I shall hereafter call our black Chokeberry. I suspect that these have been introduced from Europe under this name. The one called *Amelanchier alpina* is a slower grower than the other, with leaves somewhat narrower and less glossy above, but the differences are such as could be easily produced by cultivation. Of the same nursery I ordered a tree of the Medlar, and procured this same *Pyrus nigra!*

It may not be generally known that the Chokeberry can be used as a stock for dwarfing Apples. I have fruited the Crab Montreal Beauty on it, and have worked other Apples on it successfully. My plants were unfortunately destroyed, so that I have no knowledge of how long such plants would persist. A brief record was made of these trials in the *Country Gentleman*, 1886, page 676, and Bulletin 31, Michigan Experiment Station, page 93.

Cornell University. *L. H. Bailey.*

Foreign Correspondence.

London Letter.

MUTISIA DECURRENS continues to be a success against the sunny wall of one of the museums at Kew. All the Mutisias, and this one in particular, which is the best in a garden sense, prove awkward customers under cultivation, at least in the majority of English gardens. Even at Kew, where it is now in splendid health, this is the first decided success against many equally decided failures. This week I counted on the plant fifty-three fully expanded flowers, every one at least four inches across, as elegant as the most perfect of daisy-shaped flowers, and the color a brilliant flume-like orange-yellow. If one could be certain that the plant would behave like this whenever placed against a sunny wall, he need not hesitate to plant it largely and recommend it to every one who wanted a magnificent perpetual summer-flowering wall plant. The border in which this Kew specimen has done so well is an ordinary one, and the stems are tied loosely to a wire trellis. To keep the slugs from eating off the young shoots, of which they are very fond, a mulching of small pieces of coke is placed over the ground where the shoots push up, and this acts perfectly as a protection. The climate here is not too cold for this plant, but it is possible that a hot, dry summer would be too much for it. This year has been considerably below the average in regard to sun-heat and light, and above, in regard to moisture; a bad summer for gardening generally, but good for some things, and apparently the Mutisia amongst them. I have heard of good examples of this plant having been grown in a bed along with Rhododendrons, upon which the stems were allowed to climb.

GENTIANA ASCLEPIADEA.—A mass of this plant, fully two yards in diameter and nearly a yard high, with its scores

of stems heavily laden with rich blue flowers, is now the most attractive herbaceous plant in the rock-garden at Kew. It is planted in a moist, partially shaded position in rich loamy soil, where it has grown into its present dimensions from a small plant in about five years. Every year hundreds of seedlings spring up about it, proving that the plant is as happy and as much at home as if it were on the Swiss mountains. Indeed, it is even happier, according to Mr. Dewar, who has just returned from Switzerland, and declares that nowhere did he see this species so fine as it is under cultivation here, and he saw acres of it. In the gardens at Belvoir Castle it is equally vigorous. It ought to become a favorite for borders, or even as a specimen on lawns. There is a white-flowered variety of it.

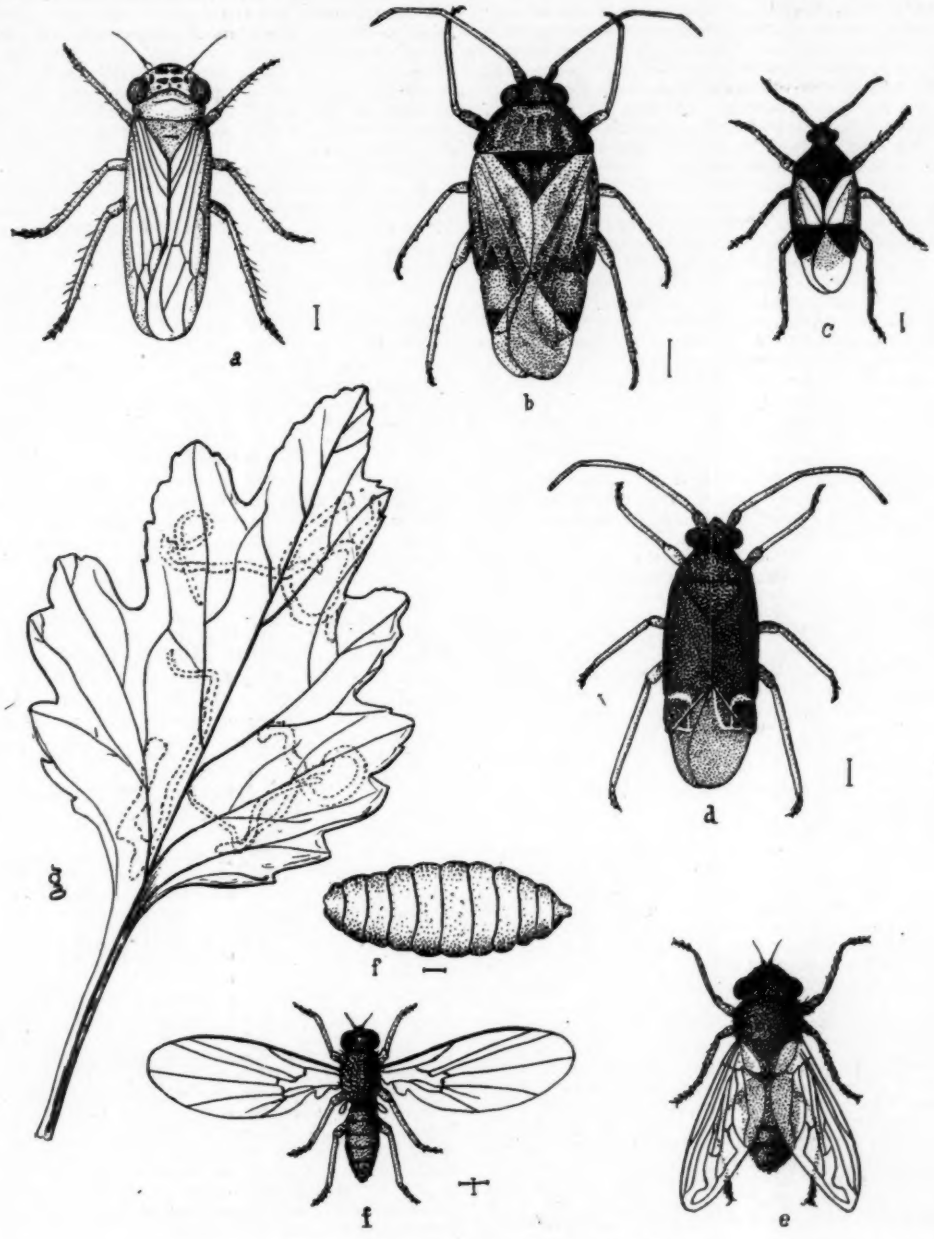

Fig. 55.—Insects Affecting Chrysanthemums.—See page 439.

(*a*) Cicadula quadrilineata. (*b*) Lygus lineolaris. (*c*) Tripthleps insidiosus. (*d*) Plagiognathus obscurus. (*e*) Eristalis tenax. (*f f*) Phytomyza Chrysanthemi fly and larva, with Chrysanthemum leaf (*g*) showing mines of larva. All enlarged except the leaf.

NEW GLADIOLI.—A bed of seedling Gladioli, comprising some half a dozen kinds, now flowering finely at Kew, is attracting much attention because of the extraordinary size of the plants and the size and rich colors of the flowers. They were obtained from Messrs. Hallock & Sons, of Queens, New York, who profess to have obtained them by crossing *G. Saundersii* with some of the finest popular kinds. These at Kew are not named, but they deserve to be, and the raisers may be congratulated on the excellence of their seedlings. Some of the spikes are fully six feet high, and they are well furnished with flowers, all of them larger than any Gladiolus we have seen, whilst the colors are brilliant as well as variable. In another part of the garden there is a fine bed of the best of the hybrids raised by Monsieur Lemoine, of Nancy, from *G. purpureo-auratus* crossed with some of the *G. Gandavensis* kinds. These beautiful plants have already won a first-class reputation, their colors being exceptionally rich, the flowers large, and the plants as easy to manage as the ordinary varieties. Monsieur Lemoine also raised some hybrids from *G. Saundersii*

and *G. Gandavensis*, which are apparently very similar to those raised by Messrs. Hallock. The latter are, however, superior so far as regards the size of the flowers and the robustness of the plants, a difference which, however, may be due to the unusual size and health of the bulbs as grown in America by Messrs. Hallock. There can be no question of the beauty and decorative value of these Saundersii hybrids.

G. DECORATUS.—This is a new plant, and is one of the most beautiful of the species of Gladiolus known in gardens. It is now in flower for the first time at Kew, whither it was sent by a missionary in 1887 from the Usagara Mountains on the east side of Africa, near Zanzibar. Although but recently brought into cultivation, the species has been known since 1858, when Dr., now Sir John, Kirk found it while in company with Dr. Livingstone. The plant has bulbs scarcely an inch in diameter, narrow, sword-shaped leaves two feet long, and a flower spike three feet high, bearing ten flowers. These are three inches long, two inches across the mouth, the lobes recurved at the apex and the color a bright scarlet with an oblong conspicuous blotch of bright yellow on each of the three lower segments. These blotches are very ornamental. The plant appears to be quite happy under ordinary cultivation and it promises to seed freely. As a garden plant it should become a favorite on account of the distinctness and beauty of its flowers. It may also prove valuable in the hands of the hybridizer.

G. PRIMULINUS.—This was obtained from the same source as *G. decoratus* and flowered at Kew lately. It belongs to the broad-leaved, robust growing section represented by *G. dracocephalus*. The flowers are as large and similar in form, but they are of a uniform pale Primrose-yellow. The plant was lately shown at a meeting of the Royal Horticultural Society. It is ornamental and should become a favorite with bulb fanciers. It may be well to mention here that to prevent possible misunderstanding, the plants sent from Kew to meetings of the Horticultural Society are not submitted to the Committee of Awards; consequently no plant from Kew ever obtains a certificate.

TRITONIAS.—These and the Montbretias are first-rate summer bedding plants. At Kew they are massed in circular beds eight feet across, and they make a great blaze of color from the middle of August till the end of the summer. In open places on the lawns, where they may be seen a long way off, they are very effective. They are quite hardy, and they increase so rapidly that a small clump, if well planted and let alone, will in a year or so grow into a great mass. Or, they may be lifted after flowering and dried in the same way as Gladioli. *T. aurea* is a well known summer flowering bulb, but the two varieties of it called *Maculata* and *Imperialis* are great improvements on the type.

MONTBRETIA POTTSII is almost as good as the *Tritonia*, but better than either is the hybrid raised from them by Monsieur Lemoine and named *T. crocosmiæflora*. In rich soil this is almost a yard high, and the branched spikes are crowded with large orange and bronzy crimson flowers. The size of the flowers varies with the quality of the soil, but even in poor soil the plant is a success. Then there are about a dozen other named kinds from the same parents as *T. crocosmiæflora*, but except in one or two there is not much difference between them. Gerbe d'or is, however, a beautiful plant, quite as tall and free-flowering as the best, the flowers being large and bright yellow. I have seen *M. Pottsii* at the foot of an old wall facing south, where it had become established, and formed a broad fringe of bright green leaves, changing in autumn to a cloud of orange-red flowers. Those here named would be equally effective in similar positions. Certainly these plants do not fill as large a place in gardens as they well might.

London. *W. Watson.*

Cultural Department.

The Propagation of Hardy Herbaceous Plants.

THE time is now at hand when these plants may be propagated from cuttings and seed with the best results. It is far better to take cuttings before they have been subjected to frost and their growth checked thereby—that is, if the convenience of a greenhouse is at disposal where a temperature of fifty degrees can be maintained at night. Another advantage is, that cuttings taken now, rooted and potted, may be hardened off in a cold frame and safely wintered there with very little trouble or expense. Such plants as *Veronica subsessilis*, *V. amethystina*, *Anthemis tinctoria*, choice double Hollyhocks, *Heuchera sanguinea*, all the perennial Candytufts, *Amerias*, *Arabis*, *Alyssum saxatile*, *Genista tinctoria* and *G. sagittalis*, Pentstemons, Salvias, Sedums, *Desmodium penduliflorum*, the perennial Peas, such as *Lathyrus latifolius* and the beautiful white variety, may be easily rooted now; the long shoots may be cut up in short pieces and they root speedily. The tufted Phloxes may all be rooted now and will make nice flowering plants next spring, as, indeed, will all of the above.

There is but one way to propagate the double *Lychnis Chalcedonica*, as it does not seed. We cut off the flowering stems as soon as they are past, when nice young shoots start from the base at once, and these make excellent cuttings and root readily. Of *L. viscaria*, *L. vespertina* and *L. diurna*, the double varieties all root readily. We have never found fall propagation of the tall-growing garden Phlox a success; they root fairly well, but winter badly, and any such plants should be lifted in fall and the young growths taken off in spring, when all will root and make strong flowering plants, and the old plants, after furnishing the cuttings, may be transferred to the border and will flower well also. The various Dianthuses, such as *D. plumarius*, may be carefully divided and those portions without roots used as cuttings. The choicer sorts of Clove Pinks and Scotch Pinks are best layered now and potted up later on, to be placed in the cold frame. This is necessary even though it is not desired to increase the stock, for these choice Pinks are apt to winter badly sometimes, and, moreover, one cannot well have too many or be without them altogether. With the double Pyrethrums our best success has always been obtained by lifting the clumps in March or when the young growth is just above ground and dividing them carefully, leaving two shoots to each portion. The other shoots may be taken off and placed in the cutting bench, where they root readily, while the rooted pieces may be potted and placed in a cold frame, and afterward transferred to the open ground in May, where all will flower, even the rooted cuttings. These Pyrethrums are now in great demand, and are annually imported by the thousand. Imported plants always start into growth on the voyage, and need very careful treatment on their arrival. We have found it best to pot them always, and place in a cool shady place for a few days and gradually harden them off to the sun and light, planting them out with the other things in May. The same remarks apply also to double Delphiniums, Potentillas and herbaceous Phloxes. It has been aptly remarked that, with importations of these plants, everything depends on the packing. Our own experience has always gone to prove the excellent way in which French goods are packed, and the many things there are yet for the English firms to learn in this matter. The freight charges on French goods are high, but the results obtained and the few losses much more than compensate for the same.

Many people may think that their gardens are already full and that there is no need of propagation; but how many are the ills that affect plants and how they seem to multiply when the specimen is an only one! How pleasant it is to know that in the reserve ground are others only waiting to take the places of such as are joining the majority or are in need of division which may check them considerably for a season, to say nothing of being able to gratify the longing glances of a friend who finds the tenth commandment very difficult to keep!

South Lancaster, Mass. *E. O. O.*

The Wild Garden.

IT is the last of August and the wild garden is still brilliant with flowers. Several Sunflowers are in bloom. One of the prettiest comes from Texas—*Helianthus cucumerifolius*. It is an annual from two to three feet in height, very branching, and with glossy, shining foliage and long, slender, spotted stems, each terminated with a flower with a dark or nearly black disk, surrounded with broad, thick-set rays. It is charmingly graceful swaying in the breeze, and is beautiful as a cut flower. It commences to bloom about the middle of July and continues until frost.

Another very pretty one is a variety of *H. lætiflorus*. This is a perennial and begins to blossom by the middle of June. It is little more than two feet in height, much branched, and with yellow florets, which, together with the numerous deep yellow rays, make it very conspicuous. At this date it is one mass of bloom.

A third species in flower has thick rigid leaves and yellow disk and broad rays nearly two inches in length. It is not so branching as either of the above, consequently not so many flowers on the plant, still it is quite showy and desirable. Were it not an annual I should call it *H. rigidus*.

H. angustifolius, our narrow-leaved New Jersey species, is just beginning to blossom. The leaves are long and grass-like,

with rough revoluted edges. The plant is very branching and when in a good situation attains a height of six feet or more. The flowers have a dark disk and bright, almost orange-colored rays. It is later coming into flower than any other species in my garden.

The pretty Cone-flower (*Rudbeckia bicolor*) has been in blossom since July. This is a showy species from Texas with a dark cone-shaped disk and almost orange rays. It is not much above a foot in height, but is very branching, and the flowers remain fresh a long time, the rays finally withering without falling. It is an annual and from all appearance will remain in flower until frost.

Polygala lutea, with heads of bright orange about the size of Red Clover, has been in blossom all summer, and is still beautiful among the Ferns and other low growing plants.

The yellow-fringed Orchid (*Planthera ciliaris*) is just passing out of flower. It has been charmingly beautiful and stately among the wild Lilies and Ferns. All these yellow flowers make a fine show during the last half of summer. And now several species of Golden Rod are beginning to add their graceful plumes among them. But the wild flowers at this season are not all yellow. The pretty little rare *Coreopsis rosea* is blooming among the Polygalas. This has rose colored rays and yellow disk. It commences to bloom about the 1st of August and continues in flower a long time. And some shrubs of the sweet scented Clethra are still in blossom.

The Clark Elm, Lexington, Massachusetts.—See page 438.

Pancratium coronarium, a member of the Amaryllis family and a native of the southern states, has proved hardy here and has just bloomed finely. As a pot plant it did not do very well, so several years ago I turned it out in the open ground to shift for itself, not knowing that it would survive our winters. For two or three years it showed only leaves during the summer, but now toward the last of August it sends up a fine flower scape surmounted with four delicate white fragrant flowers which remain perfect several days. The divisions of the perianth are long, linear and spreading, and the

crown is of delicate texture, large and somewhat funnel-shaped.

There is nothing in my garden that presents a more striking effect at this time than a clump of Sedge or Wool-grass (*Scirpus Eriophorum*). It is about five feet in height, with brownish or rust colored, soft woolly, great drooping panicles, and the long deep green foliage is also handsome, reaching up to the brown panicles. Other Sedges are also effective at this time. The Cotton-grass (*Eriophorum Virginicum*), with light rust colored, soft, cottony heads, is one of the best and as handsome as any flower. And the foliage of some of the wild plants is no less beautiful than flowers. The Sumachs and Sweet-gum and Sassafras and Swamp-Maples are already beginning to take on color as brilliant as the gayest flowers, while others, like the Alders, Birches, Bayberry and White Fringe, are still of the darkest, deepest green.

Vineland, N. J. *Mary Treat.*

Some Native Ferns.

THE Hay-scented Fern (*Dicksonia pilosiuscula*) is the only representative we have of this genus in the United States. According to Lyell's "Hand-book of Ferns," there are twenty-nine known species of Dicksonia in the world, but these are mostly natives of tropical climates, Europe having but one, northern Asia one, and one in North America north of Mexico. Ours is a very beautiful Fern, about three feet high, with fronds about twice as long as the stalks, twice or rarely thrice divided. It is found from Canada to Alabama, but is not supposed to occur outside of eastern North America. It comes from creeping root-stalks and forms dense beds of its finely divided fronds. It is so abundant in many portions of the mountainous districts of New England that it is the principal pest of many mountain farms, taking almost complete possession of cleared pasture-lands which are too rough and stony for cultivation. In tillable soil it is easily kept out. Although it does well in the shade in the moist, gravelly soils of mountainous districts, it seems to prefer the sun. It is one of our most valuable Ferns for cultivation, and is more extensively grown in England, where it is highly prized, than in its native country.

Scolopendrium vulgare (Heart's-tongue) is a rare Fern in America and the only species of the genus found in the United States. There are said to be only nine distinct species in the world. This one has been found in only two or three places in North America north of Mexico. One or two of these are in New York State and one in Canada. But in Europe it is more abundant and variable. It has many forms, one English writer claiming as many as a hundred varieties. Here it is seldom over eighteen inches high by one or two inches wide; but in Europe it sometimes attains a height of nearly four feet. The single fronds are somewhat heart-shaped at the base. It is a valuable hardy Fern for cultivation, but needs to be planted in a loamy or gravelly soil in the shade. It may be transplanted in early autumn or in the spring.

Pellæa atropurpurea (Clayton's Cliff-brake) is generally considered a difficult species to grow, and all efforts to grow it with ordinary level culture seem to have failed; but if its natural locality is closely copied it is not hard to manage. It is a useful Fern for cliff-work and when once established will continue from year to year. Mr. C. G. Pringle had a plant that lived without any care for twelve years in a shaded crevice of an old wall on the north side of his house, in Charlotte, Vermont. It is an interesting and curious little evergreen, with wiry, brittle stalks from two or three inches to a foot high. It is usually found on shaded limestone cliffs in tufts of two or three stalks, to a hundred or more in large specimens. In its peculiar habitat it is found from Canada to the Rocky Mountains, and south to Alabama, Mexico and South America.

Aspidium spinulosum (Spinulose Wood Fern) is a common half evergreen species about three feet high at maturity, with oblong-lanceolate fronds about twice as long as the stalk. These are twice or three times divided, fine and pretty. There are chaffy scales the entire length of the stalk and rachis of the frond. It is found in moist, shaded woods from Newfoundland to Oregon, and south to the southern Alleghenies. There are three forms in New England, the typical species, the var. *intermedium* and var. *dilatatum*. The latter is the largest form and grows in mountainous districts. It is a good Fern for shaded slopes and is perfectly hardy. Early autumn or spring is the best time for transplanting.

The Virginia Chain Fern (*Woodwardia Virginica*) is the best bog Fern we have and will thrive in wetter locations than any other American species. It is useful for bogs, wet margins of ponds and streams, and, unlike most other Ferns, is not affected by stagnant water. In fact, it is often covered with water in the spring or in very wet seasons, and at such times is a difficult Fern to procure from its habitat. Its height is from two to four feet, with stalks and fronds about the same length, twice divided, and from four to eight inches across at the widest part. Though not a common Fern, it is abundant enough in its peculiar localities from Canada to Florida and as far west as Arkansas. It will live in drier soil with ordinary culture, but a wet, boggy soil is its most natural home.

Southwick, Mass. *F. H. Horsford.*

Notes on Shrubs.

IT has been remarked that the Japanese *Viburnum Sieboldi* did not produce much fruit in this latitude. This statement would appear to hold true only during the early years of the growth of the plant, and as it becomes older the flowers are more generally followed by fruit, as is the case with numerous other plants. *V. Sieboldi* grafted on stock of *V. dentatum*, and now over ten years old, is very freely bearing fruit in the Arboretum this season. Unlike most other species in the genus, the drupes in the compound, slightly convex cymes of this appear to ripen gradually and in slow succession, the earliest changing color and becoming soft soon after the middle of August, and the latest not showing the same evidences of maturity until the first or second week of September. The fruit is not strikingly ornamental, being light red above and greenish beneath up to the day of ripening, when it becomes black with a blue bloom and also very soft, and soon afterward it shrivels and falls off. The pulp is dark and of peculiar taste, and so intensely sweet that it is disagreeable. After handling the soft fruit, a sticky, elastic residue remains on the hands. In size and shape the drupes have some resemblance to those of the common Wayfaring-tree (*V. Lantana*), but in the latter they are usually not so regular and smooth, and the enclosed seed is much thinner and broader. This plant has been and is still sold under the name of *V. Japonicum* or *V. Japonicum latifolium*.

The rare North Carolina Huckleberry (*Vaccinium hirsutum*), of which a figure was given in the last volume of GARDEN AND FOREST (page 365), gives a promise of being valuable in cultivation here as one of the latest of its kind to ripen fruit. The little plants in the Arboretum begin to flower early in June, and the earliest berries mature in the last days of July. The best period of fruitage appears to be about the middle of August, but berries remain on the plants until early September. The hairy character of the shining black fruit would doubtless be against it for market purposes, but upon eating it the hairs are not so noticeable or objectionable as might be supposed; and in other respects the berries are very palatable, being juicy and of pleasant flavor.

Although the Cowberry (*V. Vitis-Idæa*) naturally haunts high latitudes and altitudes, being rarely found in other situations, it may be made to grow and fruit in cultivation if given a moderately moist and cool, but not too shady, place. The bright red berries begin to ripen here about the middle of August, and they have the same acid, slightly bitter and mealy quality which distinguishes them when growing wild on the White Mountains of New Hampshire. Although hardly pleasant tasted when raw, they may, with a little cooking, be made into refreshing and pleasant drinks and sauces.

When writing of *Euonymus nanus* some European writer has expressed the opinion that it probably bore little or no fruit in this country. *E. nanus*, however, fruits quite freely in the vicinity of Boston, and the seed within the pods is fully and perfectly developed. It is the earliest species of the genus to mature fruit, the pretty pink pods opening about the middle of August and disclosing the orange colored arils. The narrow, very dark evergreen foliage and the neat, compact habit of some of the best forms of this species make it a charming and attractive little shrub for using in many situations in the garden where showy blooming plants are not a desideratum.

Arnold Arboretum. *J.*

Saccolabium Hendersonianum is the name of a charming little Orchid, which, unfortunately, is not seen often enough, owing chiefly to its scarcity in the market. In a few collections in England, however, it is found to grow vigorously and flower freely. From one of these collections—that of Major Mason, of Warwick—a specimen was recently sent to the meeting of the Royal Horticultural Society in London, where it was generally admired by the Orchid-loving fraternity. In habit the plant is dwarf, with distichous, strap-shaped, leathery leaves about six inches long and more or less recurved. The flowers, which are compactly arranged on a stiffish, erect raceme, and average as many as forty in number, have beautiful rosy pink

sepals and petals, the color reminding one, as Professor Reichenbach once remarked, of the flowers of a pretty West Indian Orchid—*Rodriguezia secunda*. The lip, which is in reality more in the way of a spur, is of a crystalline whiteness, occasionally tinged with pink at the tip, and is somewhat like an oblong inflated bladder between the broad lateral sepals.

There is no definite information to be found on record of the precise origin of this species, but it is generally supposed to have been first discovered by Mr. Stuart Low in Borneo as long ago as 1862. It was not, however, until about 1874 that it found its way into cultivation, and was soon after flowered for the first time in England in the nurseries of Messrs. Henderson, of St. John's Wood, a circumstance which led Reichenbach to name it in honor of that firm in due course.

Being a native of Borneo, *S. Hendersonianum* should consequently be grown in a tolerably warm and moist house. Baskets which can be suspended from the roof, so as to afford as much light as possible, are the best receptacles for the plants, with a light compost of fresh sphagnum and a little fibrous peat. Blocks or rafts may also be used, but if so, more attention to watering will be necessary. At the approach of summer, and during the entire hot season of the year, care must be taken as to shading, for many of these fleshy leaved Orchids are very susceptible to concentrated heat through glass.

Isleworth, London, W. *John Weathers.*

Schubertia grandifolia.—A plant of this set in the open ground in late June is now profusely in bloom. It is a very strong grower, with semi-woody white stems. The leaves are lanceolate, some five inches long by three inches wide, and as they mature, are spotted brown. The figure by Mr. Faxon in GARDEN AND FOREST (page 369), while accurately reproducing the form of the plant, cannot, of course, give a complete expression of the beauty of the pure white flowers with the brownish calyx. The flowers are of very firm substance and of smooth surface, except just over the constricted throat, where they are furnished with numerous fine hairs one-fourth to three-eighths inches long, set horizontally. The office of these hairs would seem to be the brushing of the pollen from visiting insects. The organs of reproduction are all concealed in the swelling under the throat, and no color of anthers or stigmas relieves the white of the flower. As this plant seems to grow as well in the open air as under glass, it is likely to prove a desirable addition to open air vines (climbing by twining stems), as the appearance of foliage and flowers is pleasing. The foxy odor of the young foliage is less disagreeable in the open air than it is under glass. When the plant is in bloom the somewhat heavy, fruity odor of the flowers will perfume a large house. A well grown plant will cover a space of say three feet by twenty. It is readily propagated by cuttings or seed, from the latter of which it will come into bloom in from twelve to fifteen months.

Elizabeth, N. J. *G.*

Gordonia Altamaha (pubescens).—This is one of the most beautiful of flowering trees, and just now it is in full flower here. It has been blooming for several weeks and will continue to do so until frost stops it. Philadelphia is fortunate in having a number of good specimens of this rare tree. It is to be found not only in private collections, but there are several in Fairmount Park. The original tree in Philadelphia is the one planted by Bartram himself in the historic garden in West Philadelphia which still bears his name. This tree was supposed to be dead, and in fact it did die to the ground, but on a recent visit to it I observed a sucker of several feet in length from a portion of the stump beneath the ground. It would be a most desirable thing to save this remnant of the parent tree, but as the place is now but little more than an open common, its preservation is doubtful.

In the garden of William De Hart, Woodland Avenue, Philadelphia, stands a fine example of this tree. It is, perhaps, twenty-five feet high. It is not a perfect specimen because somewhat crowded by other trees. It is, however, doubly interesting because raised by layering a branch of the original tree in Bartram's Garden. At this time of the year it often displays as many as 200 expanded flowers at once. The large, single white, Camellia-like flowers are extremely beautiful.

How far north this tree would thrive I do not know. I can say that in the hardest winters we have here it is never injured in the slightest degree, showing that it can be planted much further north than this.

The more tender species, *G. Lasianthus*, is thriving with us. Our plants have flowered profusely this year, though but two to three feet high. While very pretty, the flowers are not much more than half the size of those on *G. Altamaha*.

Germantown, Pa. *Joseph Meehan.*

The Forest.

The General Condition of the North American Forests.—I.

THE article which follows is the first part of a translation of Chapter I. of Dr. Heinrich Mayr's work, "The Forests of North America." Dr. Mayr paid two visits to this country, and his studies among our trees were made primarily for the purpose of estimating their probable economic value for introduction into German forests. It will be seen, however, that he became interested in the problems of forestry, which Americans must solve for themselves. It is well that we should know how these problems present themselves to the eye of a skilled observer from abroad, and although we may dissent from some of his conclusions and question a few of his statements, his general view of the subject in its broader lines will be accepted as correct by thoughtful readers. We hope to give the remainder of this chapter in an early number:

When the first European landed in the new hemisphere, an immeasurable area of forest lay before him. Unbroken, undisturbed, it stretched from the southernmost part of Florida to the coast of Labrador, through thirty-five degrees of latitude, and from the Atlantic coast to the borders of the prairie, fully twenty degrees of longitude. If we reckon the average length as twenty-five degrees of latitude and the average breadth as twenty degrees of longitude, we see that this primitive forest covered an area ten times as great as that of the German Empire. What exists of it to-day we can only estimate. Perhaps, however, a tenth part of the original area of primeval forest, or almost as much as the whole extent of the German Empire, still remains. In a hasty journey through this territory one receives the impression that it is almost all forest. With the exception of a few states, the forest is so conspicuous that the farms seem to occupy only a small part of the area. But a close examination of this forest reveals the fact that not more than a third part of it really deserves the name of forest; two-thirds are only scattered saplings, or a collection of isolated, gnarled, blighted trees, sometimes the last of their race.

The primeval forest grew in all soils, on the mountains as well as in the plain. No rock in the Alleghany Mountains was too steep to nourish single trees in its fissures; no soil of the plain was so poor and stony that it did not support a stately forest. Only swampy lowlands covered with water for the greater part of the year were without trees. This fact ought to be recorded for future generations; for to-day the forest in many places has been destroyed so completely that one might well doubt whether it ever existed.

Fifty years hence one who travels through the southern Pine-belt of the Gulf States will scarcely believe that the vast desert of pure snow-white sand driven hither and thither by the wind, once supported the most magnificent Pine forest in the world; no one will believe it possible that the bare, stony, steep slopes of the Alleghanies were once covered with a forest of broad leaved trees unrivaled in its variety and luxuriance. In fifty years it will seem incredible that the vast swamps of northern Wisconsin and Michigan were once covered with a thick growth of trees, and that forests of White Pine, centuries old, once swept about them.

If we turn toward the west and again in imagination pass over fifty years, we see a beneficent forest flourishing there, brought into existence by man on a plain which was once pronounced an almost useless desert. The forest was planted because the absolute necessity for it was felt. This western plantation thrives under human protection; but it is a misfortune that so many worthless kinds of wood have been planted, for the European species, from the young growth of which much was expected, are unsatisfactory as they approach maturity. It is to be regretted, too, that the production of fire-wood has been sought rather than the production of lumber by means of a more open system of planting; for, in case of necessity, timber-trees always make the best fire-wood.

Let us go still farther west. In fifty years it will be inconceivable that California, the beautiful fruit-garden of the Union, was once treeless. Amid magnificent forests of Australian Eucalyptus and Acacia the visitor will be inclined to doubt that he is really in America. The hard, sun-baked plains have been transformed into a sub-tropical garden under the influence of this delightful climate. But it has been an expensive task to dam up the turbid streams which pour down from the mountains during the rainy season,

and to divert them from the fertile plain. Much money has been sacrificed in irrigating the land, because the almost free watering of the country by means of the natural brooks from the mountains, has been made impossible by the reckless destruction of the mountain forest.

The path along which the country is advancing toward the future here depicted may now be plainly seen. In the description of the different regions, in subsequent chapters, an opportunity will present itself to prove the correctness of the gloomy, although not hopeless, forecast. Let us consider a few more facts that everywhere meet the observant traveler in America. Many treeless mountain slopes retain a little soil in the fissures of the rock-ledges with here and there sparse grass, which cattle crop from day to day. But the stumps of the trees are still there, and their roots, hanging like a spider's web over the bare rocks, show what a depth of soil, and the best of soil, has been washed away. One year has here destroyed what a hundred years cannot restore. The rain, which formerly was caught for the most part by the forests and slowly given up into the valley through the springs, flows now without hindrance into the lowlands, to devastate instead of to bring fertility. The noble mountains and valleys of the Alleghanies, of the Adirondacks and of the western mountain region are hastening with giant strides to the same fate.

Already many have raised their warning voices, but they have been regarded as dreamers; and the people have deceived themselves with the cry that the forest wealth of the country is inexhaustible. They cry the loudest who profit most by the present destructive methods, while the nation remains blind to the condition and the future of the forests. The nation is not informed about its own possessions even; much public land is officially reported as "covered with forest," from which the best timber was stolen long ago; much has been burned, and the rest is doomed to destruction in a few decades. And as if to destroy all hope for the future, fire is let loose to run through the forests every year.

The state of New York, to give an example, has, or rather claims to have, in the Adirondacks 780,000 acres of "unimproved" land, or woodland. The Commission appointed to inquire into the condition of the woods of these mountains found itself unable to settle the bounds of the public lands, because private persons claimed so much of the state woodlands as their own property. In a few districts the state has continuous woods, but commonly only in parcels less than 300 acres in extent. Nothing practically has been done by the state of New York to protect and preserve her woods. She does not even know their boundaries. Many settlers live notoriously by robbery from the state woods, and with fire and axe help the state to "improve" the woodland belonging to the people,—that is to say, to destroy the forest and the forest-soil.

Naturally it fares thus with national property under the protection of the general Government, since the nation pays no attention to the matter; indeed, the public lands are spoken of almost as if they belonged to private persons, or rather to nobody, and as if every citizen had not a legal interest in them.

As one goes westward from the metropolis in America, the perception of legal rights becomes less clear. According to the official report for the year 1883 the national Government some time ago allowed poor settlers and miners in Colorado to take wood from public land for the building of houses. The statute was liberal; the interpretation of it by the settlers was, however, still more so. Government officers who went out there after a few years, found lying in a mountain torrent half a million railway ties destined for the "domestic use" of a broad-gauge railway. Moreover, I read in the report of Mr. Fernow that the Government pays every year hundreds of thousands of dollars for the protection of the forests; but of what use is this, when the money disappears, one knows not whither, without the forest's deriving the least benefit from it?

To the honor of the present administration of the public lands, I may now add that the Government has awakened to the needs of these lands, and can boast that it has given back to the nation large quantities formerly held and used unlawfully by private persons and corporations.

In all mountain country, and poor land that has little agricultural value, on all banks of streams, as long as they are not regulated artificially, the preservation of the woods is demanded by nature for the protection of the lowlands. I am not of the opinion that it is necessary for the Government to retain land suitable for agriculture, in order to cultivate it as forest. The Government should concentrate its means and energies where its help alone can preserve a condition profitable to the people at large.

In consequence of the enormous wealth of the country and the productive power of its enterprising people, the Government has a large surplus in its treasury. I am of the opinion, which might be thought ridiculous in America, that there could be no more fitting return of part of the money to the people than to buy up the woods on the mountains and upon natural forest-land, in a word, all the forests which in the hands of individuals are doomed to destruction, and through legislation of the simplest kind, something like the system in use in India, to protect the forests against fire, to administer them through public officers, and, by means of a sufficient number of guards, to preserve them against thieves, hunters and tourists. The Government, and only the Government, can afford to make the sacrifice of present loss of interest upon the investment. In a few decades it would come back tenfold.

The consequences of the deforesting of the mountains are well known. We have the best examples of it in the Old World. Let us throw aside the delusion that all things are different in America; the laws of nature are everywhere the same. The soil may be better, the climate more favorable for tree-growing; but the disasters which have visited the Old World can only be delayed, not prevented, in the New. If the mismanagement and the burning go on in the old fashion, it needs no prophet to foretell the fate of the mountains and the land watered by their streams; America will soon have produced pictures which for grandeur of devastation cannot be surpassed by the mountains of the southern Tyrol, southern France and Spain. The Government owns numerous mountain forests, yet it strives to free itself of the burden as quickly as possible, and often at a ridiculous price. The giving away of the forests by the Government is equivalent to their ruin. It may be said that the Government even helps the destruction, although its duty is to prevent the spoliation of the land by a few at the expense of the whole people. Personal liberty and inviolability of property are fundamental ideas of the Constitution of the United States. But paying respect to the personal freedom of an unscrupulous person means trampling under foot the personal freedom of a thousand better men.

This proposition in itself justifies a demand by the nation that the mountain forests, no matter to whom they may belong, must be preserved. In order that hundreds of others may be able to have the full use of their own possessions, it is not unjust that the rights of one should be restricted. It is amusing to hear American opinions about the despotism of European governments which restrict private citizens in their right to property. The law for the protection of the mountain forests and land useless for agriculture, as well as lands upon water-courses, is made only to restrain the ignorant or unprincipled; the great majority of owners of mountain forests do not need the law at all, since they themselves are wise enough to know that in preserving the forests they are maintaining the value of their own property. If under the Constitution it is impossible to compel the individual to preserve his forest, the Government should have the right, for the good of all, to take possession of the property of a refractory citizen for a reasonable compensation, and manage it. The forests in the mountains or on the poor sandy plain which are now given away or sold, the Government in the next century will be obliged to buy back at great outlay, because the individual, unlike the Government, does not give anything away. The amount which the French Government has expended for reforesting denuded mountain slopes affords an instance of the costly character of such work. Let us hope that in the meantime all productive soil will not be washed away.

As before said, the forest must be preserved upon all kinds of land which admit only of tree-culture, especially upon dry, sandy soil and land of a swampy character. Such lands are common in America, particularly in the south, where they embrace thousands of square miles along the coast of the Gulf of Mexico and of the Atlantic Ocean. The noble forests of the finest Pines in the world have there been swept away, and the young growth destroyed by fire. The white sand already shines in its nakedness through the thin grass, the very picture of the future that I have described. With the last tree and its shade, the grass also will die. The great quantity of fructifying rain which this region receives cannot prevent the disappearance of all vegetation under this management; and only the sand will remain. Nothing is done here to check the evil and to save the land. Perhaps laws now exist for guarding the mountain forests; but laws that no one fears to set aside lightly, are worse than none. Wisconsin, Michigan and Minnesota contain extensive broad-leaved and coniferous

forests on level or gently rolling ground. Many hundred square miles of so-called swamps are covered with Larch, White Cedar (*Thuja occidentalis*), or Spruce and Balsam. Beneath low trees lie thick, damp cushions of moss, in which *Vaccinium macrocarpum*, Andromeda and other shrubs find a home. These kinds of growth owe their existence to the presence of this moss in the swampy places, because they can strike their roots in the decaying cushions above the surface of the stagnant water. If such swamps should be stripped of their trees, the cushion of moss would disappear under the influence of light, increased warmth, and the drier air; the light-loving swamp plants, Arundo, Typha and Carex, and nut-bearing shrubs, would then step into their place. Finally the soil would become sour, and be rendered unfit for use. Already many a resident in these new states can recall that this or that flag-swamp or grass-swamp, now impassable, was once covered with a forest, even if of little value. Such facts suggest to me the dark picture of the future of these rapidly developing states.

Correspondence.

To the Editor of GARDEN AND FOREST:

Sir.—Will you tell me what to plant in a dry, gravelly spot on the south side of a close fence as a screen? *Hydrangea paniculata* has flourished there during the two wet seasons just past. This year the shrubs are completely burned up and must come out.

Providence, R. I. *B.*

[Privet is one of the shrubs which will grow in a very hungry soil, although it will grow much better in a deep rich one. Some species of Elæagnus, preferably *E. hortensis*, will grow on open gravelly banks, and so will the common Barberry if it is encouraged to start by placing some good soil about its roots. The American Beech will grow in poor, dry soil and will endure cutting well, and if held down to shrub size by the knife a Beech screen would have considerable beauty. But if the space is not very large, why not fill it in to the depth of a foot or two with good loam? Any one of a hundred shrubs could then be safely chosen.—ED.]

Recent Publications.

Dreamthorp. A book of essays written in the country. By Alexander Smith. Rochester: George P. Humphrey.

The publisher of this dainty little volume has done a genuine service to a generation which rarely makes mention of the name of Alexander Smith. A few nervous lines from his earlier poems still linger in the memory of persons now past middle age, but even they have forgotten that after the chilling reception of "Edwin of Deira" Mr. Smith left off making verses and began to write essays. The series now published here was written from a sleepy, moss-grown town, where time ought to have been measured, as the author well says, by the silent dial rather than the ticking of a clock. Very pleasant bits of criticism of men of letters such as Montaigne and Lamb and Chaucer can be found in these pages, and much sound philosophy very pleasantly disguised in the form of light and confidential talk. But the book is noticed here chiefly on account of the fresh and delicate touches with which the scenery of this slumberous region is presented to the reader.

We do not know whether Dreamthorp was a real village or whether the garden from which and about which our author discourses had any existence outside of his imagination; but it would be hard to find a more pleasant description of a quiet inland country or of the thoughts which such scenery brings to the mind of a man of leisure in a contemplative mood.

Periodical Literature.

A Bulletin just issued by the Agricultural Experiment Station of Cornell University attempts to give some reasons for the almost total failure of the fruit crop in western New York the present year. All fruit-trees gave a wonderful profusion of bloom, and since the apple crop had been light last season a great harvest was expected this year. Heavy rains fell while the orchards were in bloom, and soon after the blossoms withered and the leaves of Apples, Pears and Quinces began to blight. The rains were succeeded by a severe drought, so that Apple orchards over thousands of acres seemed to be dying, while Quince orchards appeared to be scorched. It has been supposed that a cold rain in blooming-time will prevent fertilization of the flowers, but there is no reason, it is said, for accepting this as generally true. As an evidence to the contrary it is stated that two Seckel Pear-trees of the same age and equally exposed, standing but a rod apart, were in bloom at the same time; one of these has no fruit now, while the other is loaded. In most cases this year the apples had set, and were as large as small peas when they withered and fell. At the same time the young leaves began to blight, and many other facts show that there was some intimate connection between the death of the flowers or young fruit and the blighting of the foliage. This blight is caused by the Apple Scab Fungus, which may have attacked the young fruits, or it may have impaired the vitality of the trees so far as to cause the fruit to fall. Some mycologists believe that this infection of the fruit takes place very early, but the blight of the leaf in many cases seems sufficient reason for the failure of the fruit. This Fungus, *Fusicladium dendriticum*, which destroys the foliage, is the same which causes the scab on the fruit. It has always been to some extent prevalent in New York, although of late years it has increased rapidly. The wet spring afforded a good condition for rapid growth. A closely related species (*Fusicladium pyrinum*), and by some regarded as identical with the other, attacks the Pear, and has no doubt caused much of the failure in the crop this year.

Upon the Quince a specific leaf blight (*Entomosporium maculatum*) has been very serious this year. It also attacks the fruit of Quince and Pear, causing them to crack. It is the same Fungus which preys upon the stocks of Pear and Quince in the nursery and renders their cultivation precarious. The trouble has become so serious in some places that Quince-growers are preparing to cut down their orchards. This leaf blight is not to be confounded with the well known and deadly Pear blight which sometimes attacks the Quince, but which is less prevalent this year than usual.

The injury to Apples, Pears and Quinces by the Scab Fungus is not vital, although it checks the growth of trees. As a rule the effect of leaf blight in western New York will probably be to develop a large crop of fruit-buds. Heavy crops have followed the failure from blight in former years, but if next spring should be wet and cool the Fungus may probably spread again as it has this year. Carbonate of copper is a sure remedy for this Fungus, and it is probably best to begin with it before the flowers open and to make from four to six applications before the 1st of August. Three should be made at any rate, one before the blossoms open and just after they fall and another three or four weeks later. Some of the Fungus can probably be destroyed by spraying even in August, but it is doubtful whether such application would pay. The Bordeaux mixture, the formula for which has often been given in these columns, is the best application for the Quince leaf blight.

The principal cause of the loss of the Peach crop this year is the curl-leaf, a Fungus disease. Nearly all the leaves crumpled and fell from Peach-trees last spring over a large extent of country, and the loss of foliage caused the death of the young fruit. New leaves soon appear and in strong trees little injury follows. No remedy is known for this affection, and it would be difficult to apply one, as the disease is so uncertain in its attacks. Whatever fruits escaped from the curl-leaf were attacked by the curculio, which is becoming very abundant, and which must be persistently fought if Peaches are to be grown in western New York. The old remedy of jarring the trees holds it in check, and Paris Green, at the rate of one pound to 350 gallons of water, applied early and often will be found useful. The worst enemy to Peach-growing in New York generally is the Yellows, a mysterious disease which can only be held in check by cutting out every affected tree. There is a law which compels Peach-growers to destroy trees affected with this disease, but it is not enforced vigorously. It is a constitutional disease, progresses slowly and is distinguished by premature fruits which bear well defined reddish spots which extend in the flesh. When the tree is not bearing, the first symptom is the appearance of yellowish, small-leaved, short shoots on the body and larger branches; afterward they appear in bunches. The tree soon becomes weak and yellowish throughout, the leaves are small and it dies in about three years. Yellows must not be confounded with yellowness. The first is a specific disease, the latter may be caused by anything which lowers the tree's vitality.

The most serious trouble with small fruits this year was the anthracnose or cane-rust of Raspberries and Blackberries. The growing canes became pitted with brownish black blotches, and on the weakened canes the berries dry up as if from drought. On the Station plantations the Shaffer plants especially were badly diseased. It is important in the treatment of this disease to keep the plants strong and healthy. They should be cultivated lightly once or twice a week until the berries begin to

ripen and after the berries are off, until well into August. There is reason to believe that this disease can be held in check by timely spraying with the Bordeaux mixture, and any treatment will be more beneficial if the diseased canes are cut and burned immediately after fruiting.

The Strawberry blight has been serious on some varieties and in some parts of the state. The most approved remedy is potassium sulphide (liver of sulphur) sprayed on the vines once in a week or ten days from the beginning of the growing season until the fruit begins to ripen. One ounce of the sulphide to eight gallons of water is the proper strength for the mixture. After the crop is gathered the plants may be mowed and burned over, or destroyed by spraying with sulphuric acid at the strength of one pint to six gallons of water. New leaves start soon and the plants are not injured.

The advent of rots and mildews in the New York vineyards is also chronicled, but it was to be expected, and no doubt these diseases will spread. The means are at hand, however, to keep these diseases easily and economically in check, and we have often given them. Professor Bailey concludes by urging upon fruit-growers the importance of a state law which looks toward the control of contagious plant diseases. New Jersey has recently passed such an act, and if some officer is empowered to look after the fruit interests under the law, an improvement in the health of orchards and vineyards may be expected.

Notes.

We received last week several clusters of the Green Mountain Grape from the Messrs. Hoyt, of New Canaan, Connecticut. The grapes were in fair-sized clusters, fully ripe, and in flavor and aroma were superior to any of the old varieties which ripen so early in the season.

Osbeck's Sumach (*Rhus semialata*, var. *Osbecki*) has been exceptionally full of flowers this year and they have but just fallen. Large greenish white panicles at the extremities of the limbs, and held well out above the clean foliage, make the tree particularly conspicuous at a season when there are few others in blossom. It is noteworthy that the bees seem to be especially attracted by the flowers.

Referring to the fact that Mr. Gilchrist named in his list of twenty native plants for florists' use (see page 423) Swamp Milkweed (*Asclepias incarnata*), a correspondent calls attention to a pure white form of the recognized var. *pulchra* of this species. This plant grows in great abundance, it is said, in Wayland, Massachusetts, along the road-side on the way to Saxonville, and is pronounced one of the best of decorative plants at this season.

Nearly fifty years ago the *Revue Horticole* thus described a gigantic Cactus—*Cereus speciosissimus*—then growing at Andilibly, in the Valley of Montmorency: "It is an old plant and has been growing in the ground in a greenhouse for seven years past. It covers the whole surface of the wall, which is fifteen feet high and forty feet long. It produces every year from 1,500 to 2,000 flowers. From 400 to 800 are often seen expanded at the same time, when the effect of the rich colors is that of a glowing and superb tapestry."

A correspondent of the London *Garden* says that the trees in the gardens and squares of Edinburgh are as dingy as can be seen in any town, with the single exception of the Oriental Plane, which in the latter part of August was still conspicuous with its glossy green leaves; and it looked especially healthy among the fading Elms, Thorns, Sycamore Maples and Limes. The Elm seemed to the writer to suffer worst of all, because its rough leaf has an exceptional capacity for holding smut and dust, so that the middle-aged Elms in some of the streets were almost as black as the railings under them.

Colonel Pearson writes from Vineland that success in treating Grapes with copper sulphate for black rot and mildew has been as complete this year in that region as could be hoped. All those who have sprayed their vines with the Bordeaux mixture early and often have almost perfect crops of Concord Grapes. Most of the vineyards there, however, were stripped of their blossoms by the Rose bug, and only a few vine-growers have had the energy to spray their vineyards. Unless these precautionary measures are taken it would seem that for the present Grape-growing is impossible in infected regions.

The *United States Miller*, in describing an enormous flume recently built to bring water into the city of San Diego, California, states that its whole length is lined with redwood. As this length amounts to forty-five miles, it is difficult to compute the quantity of fine trees which must have been utilized in this single enterprise. We may hope that less interesting species were used to build the trestle-work which bridges the valleys and ravines over which the flume passes, for the number of these is great, and no filling-in was allowed owing to the danger of landslips when this expedient is adopted instead of trestles.

The late Henry Winthrop Sargent was so famous in his day as a horticulturist and pomologist that it is interesting to find in *Downing's Horticulturalist* for the year 1847 an estimate of the varieties of fruits then growing in his garden at Wodenethe, near Fishkill. Apples are not included, as these he grew on another part of the estate, but, in addition to thirty-one varieties of foreign Grapes grown under glass, we are told of 106 varieties of Pears, sixty of Peaches, fifty-six of Plums, fourteen of Nectarines, twelve of Apricots, eleven of native Grape, twenty of Cherries, three of Quinces, six of Raspberries, four of Currants, fourteen of Strawberries and twelve of Gooseberries—all of them the choicest kinds then known.

The case against the Northern Pacific Railroad, brought by Jacob Austin several years ago, has just been decided in favor of the plaintiff by the United States Supreme Court. The cause of action was for damage to plaintiff's standing timber from a fire set by sparks from an engine. The original complaint alleged $475 damages, but the testimony developed that more damage than that had been done, and the plaintiff asked leave to amend to $1,000. The case went to the Supreme Court of Minnesota on the judge's affirmative ruling on this motion. It has since gone to the Supreme Court twice—three times in all—and once to the United States Supreme Court. The latter court gives the plaintiff $750 damages, together with costs and disbursements. The total verdict is about $1,100 for Mr. Austin.

Whether or not there are any oospores to be found in the potato-rot, *Phytophthora infestans*, is a question on which opinions are divided. Some of the British botanists accept the views of Worthington Smith, who in 1875 described bodies which he believed to be the oospores, by means of which the rot is able to survive the winter and start up again in the spring. On the other hand, German botanists generally adopted the view that the bodies in question were not the true oospores. The latest contribution on this subject is that of Dr. J. Smorawski in *Landwirthschaftliche Jahrbuecher* of the present year. In cultures of infected potatoes in specially prepared covered vessels he noticed that the mycelium not only produced conidia, but also in places swelled so as to produce oogonia-like bodies. In some cases cells were seen in contact with the oogonia, and Smorawski regards them as antheridia. But in other cases there were no antheridia, and in such cases he thinks it possible that oospores are produced in the oogonia without the action of the male, or, in other words, apogamously, to use the expression adopted by botanists. It must be said, however, that the complete development of the oospores is not figured by Smorawski, and the doubtful point with regard to the existence of oospores in the Potato-rot can hardly be said to be fully settled by Smorawski's observations.

The summer meeting of the American Forestry Association at Quebec last week drew a large attendance, including many delegates from the United States. Lord Stanley came to the meeting and made a very business-like address, as did the principal officers of the Province of Quebec. Lieutenant-Governor Angers gave some very striking figures to show how the forest-wealth of the Dominion had been squandered, while at the same time he made it clear that the Canadian method of leasing the public lands was much more satisfactory than the practice in the United States of selling forest-property outright. The Province of Quebec alone has produced since 1867 ten and a half billion feet of lumber, while the Crown timber dues during the same period had amounted to about ten millions of dollars, and during the last year the revenue from this source alone amounted to nearly a million of dollars. It is no wonder that the authorities of the Dominion are beginning to inquire how long the forests can survive such attacks. No officers were elected at this session; business of this sort will be transacted at a winter meeting which will probably be held in Washington. The discussions, as was very proper, were largely devoted to forest-interests of the Dominion, but excellent papers were read by Professor Lazenby, of Ohio; Colonel Ensign, of Colorado; N. H. Egleston, of Washington; Gen. James Grant Wilson, of New York; H. G. Joly, of Quebec; William Little, of Montreal; M. Vilmorin, of Paris; H. B. Ayres, of Minnesota, and B. E. Fernow. It is our purpose to publish abstracts of some of these papers at an early day.